CELLULAR TELEPHONE AND ELECTRONIC CAMERA SYSTEM WITH PROGRAMMABLE TRANSMISSION CAPABILITY

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates the additions made by reissue.

CROSS-REFERENCE TO RELATED APPLICATIONS

This is a continuation of application Serial No. 08/842,458, filed Apr. 24, 1997, *now U.S. Pat. No. 5,943,603, which is a divisional of U.S. patent application Ser. No. 08/426,993, filed Apr. 24, 1995, now U.S. Pat. No. 5,666,159.*

FIELD OF THE INVENTION

The invention is directed to an electronic camera system. More specifically, the invention is directed to an electronic camera system that includes a transmission mechanism for sending image data to selected receiver units.

BACKGROUND

Motion video cameras and electronic still cameras have been utilized for several years in applications involving image data transmission. Electronic image data generated from a video camera, for example, can be transmitted by a conventional broadcast television station and received by any television in the broadcast area tuned to the appropriate channel. It is not possible, however, for the transmitter to select which receivers will obtain the image data, as selection is controlled at the receiver. Image data from electronic still cameras has been transmitted via conventional telephone lines to selected receivers through the use of a computer equipped with a modem. The image data must first be downloaded from the electronic still camera to the computer, which then transmits the image data to a second modem equipped computer via the telephone line where it can be viewed or printed. Unfortunately, the requirement for a telephone line to transmit image data does not allow images to be quickly and easily transmitted from remote field locations to receiver units. While systems have been proposed that utilize radio frequency transmission to transmit image data from an electronic camera to an individual base unit, none of these systems have the capability of selectively transmitting image data to a plurality of receiver units.

In view of the above, it is an object of the invention to provide an electronic camera system that includes a programmable transmission capability for selectively transmitting electronic image data to a plurality of remote receive units.

SUMMARY OF THE INVENTION

The invention provides an electronic camera system that includes a programmable transmission capability for selectively transmitting electronic image data to a plurality of remote receiver units. In one preferred embodiment of the invention, a camera module is detachably coupled to a portable computer including a display screen and a data entry device. The camera module includes an electronic image sensor for generating digital image data representative of a scene to be imaged. The electronic image data generated by the camera module is supplied to the portable computer for display on the display screen. The data entry device is used by an operator to select which of the plurality of base units

are to receive the digital image data. The digital image data is supplied by the portable computer to a radio-frequency transmitter module for transmission to the selected receiver units. The radio-frequency transmitter module is formed either integral with the portable computer or, like the camera module, is detachably coupled to the portable computer. In a further preferred embodiment, a combined telephone/camera unit is provided that includes a camera module for generating electronic image data representative of a scene to be imaged, a memory unit for storing the electronic image data generated by the camera module, a display screen for displaying the electronic image data stored in the memory unit, a mechanism for selecting which of the plurality of receiver units is to receive the digital image data, and a cellular transceiver for transmitting the digital image data to the receiver units selected by the selection mechanism.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention will be described in greater detail with reference to certain preferred embodiments thereof and the accompanying drawings, wherein:

FIG. **1** is a diagram of a camera system in accordance with a first embodiment of the invention;

FIG. **2** is a perspective side view of a camera module utilized in the camera system illustrated in FIG. **1**;

FIG. **3** is a front view of the camera module illustrated in FIG. **2**;

FIG. **4** is a schematic block diagram of the components of the camera module illustrated in FIG. **2**;

FIG. **5** is a flow diagram illustrating the operation of the camera system illustrated in FIG. **1**;

FIG. **6** illustrates the display of a captured image and a receiver unit menu selection on a display screen of the camera system illustrated in FIG. **1**;

FIG. **7** is a perspective front view of a combined telephone/camera unit in accordance with a second embodiment of the invention;

FIG. **8** is a top view of the combined telephone/camera unit illustrated in FIG. **7**;

FIG. **9** is a schematic block diagram of the combined telephone/camera unit illustrated in FIG. **8**;

FIG. **10** is a flow diagram illustrating the operation of the combined unit illustrated in FIG. **7**; and

FIG. **11** is a diagram illustrating the transmission of image data to a base unit utilizing the combined unit illustrated in FIG. **7**.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

A diagram of a camera system in accordance with a first embodiment of the invention is illustrated in FIG. **1**. The camera system includes a "clip-on" electronic camera module **10** coupled to a pen-based computer **12** that includes a radio frequency (RF) transmitter module **14** including an antenna. The camera module **10** can be of a form described in copending and commonly assigned U.S. patent application Ser. No. 07/988,517 entitled "Electronic Camera with Memory Card Interface to a Computer", which describes a removable camera module that fits into and interfaces with a standard PCMCIA card interface slot of a pen-based computer, or of a type described in copending and commonly assigned U.S. patent application Ser. No. 07/988,560 entitled "Electronic Camera Incorporating a Computer-Compatible Bus Interface", which describes a removable